

The current situation of digital transformation in Chinese higher education institutions: A SWOT–PEST analysis using the modified priority needs index

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Abstract: This study investigates the current situation of digital transformation in Chinese higher education institutions (HEIs) by examining internal and external environments through a SWOT–PEST framework. A dual-response questionnaire was administered to 384 respondents (336 students and 48 lecturers) from HEIs in Beijing, China. The internal environment was operationalized through four elements of educational administration (data management, human resources management, financial management, and academic affairs management), while the external environment was assessed using the PEST dimensions (politics, economy, society, and technology). Mean scores for current and desired conditions were analyzed using the modified Priority Needs Index (PNI modified) to classify internal strengths/weaknesses and external opportunities/threats. Results indicate that data management constitutes the main internal weakness, whereas human resources management, financial management, and academic affairs management are relative internal strengths. Externally, the economic dimension emerges as the primary threat, while political, social, and technological aspects are perceived as key opportunities. These findings provide an empirical basis for designing more targeted and feasible digital transformation strategies for Chinese HEIs.

Keywords: China, Digital transformation, Educational administration, Higher education institutions, PEST framework, SWOT analysis.

1. Introduction

Digital transformation has become a strategic priority for higher education because it reshapes how institutions deliver services, manage learning and teaching, and make evidence-based decisions through the effective use of digital technologies and data [1]. For Chinese higher education institutions (HEIs), the urgency is amplified by the scale and complexity of the sector and by rising stakeholder expectations for accessible, efficient, and personalized digital services, alongside intensified demands for institutional quality assurance and agile governance [2].

However, prior research consistently shows that digital transformation outcomes depend not only on the adoption of new systems but also on the internal environment (such as educational administration) and the external environment (such as PEST factors) [3, 4]. In this context, establishing the current situation of digital transformation in Chinese HEIs is necessary to support realistic, targeted strategy-making by conducting a systematic diagnosis of internal strengths and weaknesses alongside external opportunities and threats. Such analysis would identify which educational administration elements institutions can mobilize, where foundational deficiencies may constrain scaling and integration, and how political, social, technological, and economic conditions shape both constraints and enabling factors.

Despite the growing body of literature on digital transformation in higher education, few empirical studies have systematically applied SWOT–PEST analysis combined with quantitative priority needs

assessment in the Chinese HEI context. This study addresses this gap by providing empirical evidence from Beijing HEIs, using the modified Priority Needs Index (PNI modified) to quantitatively prioritize internal strengths/weaknesses and external opportunities/threats.

Accordingly, this study aims to: (1) assess the internal environment of Chinese HEIs in terms of educational administration elements, and (2) identify external PEST factors that constitute opportunities and threats for digital transformation. Such an evidence-based situational analysis would help delineate feasible transformation pathways and support HEI leaders and policymakers in developing more prioritized, actionable, and decision-relevant strategies to further digitalize their higher education institutions.

2. Research Questions

1. What are the strengths and weaknesses of the internal environment in terms of educational administration in the digital transformation of higher education institutions?
2. What are the opportunities and threats in the external environment, in terms of the PEST framework, in the digital transformation of higher education institutions?

3. Literature Review

3.1. Core Commitments of Digital Transformation in HEIs

Digital transformation in higher education institutions (HEIs) is a strategic and systemic process through which an institution reconfigures its educational, administrative, and governance arrangements using digital technologies and data infrastructures [5]. This concept differs from digitization, which converts analogue artifacts into digital form. It also differs from digitalization, which optimizes existing processes through discrete digital tools [6]. By contrast, digital transformation involves coordinated change in strategy, organizational structure, professional practice, and culture [7].

Digital transformation in HEIs reveals that its efficacy and sustainability are predicated on its articulation as a set of core institutional commitments:

1. *Digital learning and shared resources*: Studies of digital pedagogy and open education emphasize open educational resources, reusable digital content, and interoperable platforms as mechanisms for scaling quality and reducing duplication [8].
2. *Equitable education*: The literature presents equitable education as integral to transformation, cautioning that digital initiatives can intensify stratification if access, accessibility, digital capability, and learner support are not addressed directly [6].
3. *Effective communication and collaboration*: Research on digital strategy identifies effective communication and collaboration as necessary for overcoming institutional silos and stresses alignment across academic and administrative units [9].
4. *Community participation*: Work on governance and responsible innovation underlines community participation, arguing that students, faculty, staff, employers, and societal partners should be involved to strengthen legitimacy and relevance [10].
5. *Evidence-based policymaking*: Studies of datafication highlight evidence-based policymaking as a core commitment, emphasizing that data can enhance planning and evaluation, but only when data quality, transparency, and ethics are institutionally governed [11].
6. *Data-driven instruction and assessment*: Scholarship on learning analytics foregrounds data-driven instruction and assessment, linking analytics to feedback and improvement, while warning about surveillance, bias, and reductive measurement without safeguards [12].

Collectively, these commitments fit the Chinese HEI context because they align with system-level approaches to informatization and modernization. They also operationalize transformation as coordinated capacity building rather than isolated technology adoption.

3.2. SWOT Analysis of Digital Transformation

A SWOT analysis is frequently employed in situational analysis to translate complex organizational internal environments on the micro level and external environments on the macro level into actionable diagnoses of internal strengths and weaknesses and external opportunities and threats [13]. In the digital transformation domain, SWOT is particularly useful because digital transformation outcomes depend simultaneously on institutional internal forces and external forces that may enable or constrain change [14].

3.2.1. The Internal Environment

The internal environment of digital transformation is conceptualized from an educational administration perspective and operationalized through four elements of educational administration in higher education institutions.

Data management is treated as internal because digital transformation increases institutional reliance on data infrastructures and integrated information systems, requiring governance for interoperability, data quality, stewardship, privacy, and ethical accountability. Research on data infrastructures and the datafication of education emphasizes that such capabilities are organizational (not merely technical) and shape the legitimacy and effectiveness of digital initiatives, while learning analytics scholarship highlights the need for institutional policies and governance to ensure responsible data use [9].

Human resources management is included because digital transformation is enacted through people and organizational routines. Digital transformation studies and change theory identify staff capability building, role redesign, incentives, and change leadership as preconditions for sustained adoption, and higher education technology research stresses that academic contexts require professional development and workload/role recognition to translate platforms into pedagogical and service improvements [8].

Financial management is included because transformation entails lifecycle-based and recurrent costs, making budgeting, procurement, and sustainability governance central internal conditions. Digital transformation research emphasizes that value realization depends on sustained investment governance rather than one-off purchasing, and higher education policy analysis links financial capacity to uneven implementation across diversified systems, which is relevant to China's differentiated higher education sector [7].

Academic affairs management is included because digital transformation is educationally consequential only when integrated with curriculum governance, assessment, quality assurance, and academic integrity. Research on digital learning environments emphasizes institutional governance arrangements as determinants of coherent implementation and educational quality, while UNESCO further underscores that system-level digital expansion must be matched with institutional mechanisms that assure quality, inclusion, and ethical practice [15].

Together, these four elements provide a theoretically grounded, administration-focused lens for capturing internal conditions that prior scholarship associates with HEIs' digital transformation, and they are salient to Chinese HEIs given policy-driven platform building alongside documented variation in institutional administrative capacity.

3.2.2. The External Environment

The external environment is structured using the PEST framework (Political, Economic, Social, Technological) because environmental scanning research treats PEST as a parsimonious and widely adopted approach for capturing macro-level conditions that shape organizational options while remaining analytically distinct from internal administrative capacities.

Political conditions are central for Chinese HEIs because higher education and digital governance are strongly shaped by state priorities, regulatory regimes, and accountability systems that influence institutional digital agendas, including governance expectations around data and security [16].

Economic conditions are relevant because macroeconomic development and fiscal distribution affect institutions' ability to fund infrastructure, cybersecurity, and human capability building, and they shape the affordability and scalability of digital provision across a stratified higher education system [17].

Social conditions matter because digital transformation reshapes participation, expectations, and legitimacy. Higher education technology scholarship highlights how inequalities in access and support, as well as trust concerns around surveillance and data use, shape the acceptability and lived effects of digital initiatives, and post-pandemic analyses emphasize shifting societal expectations for flexible learning and robust digital services [18].

Technological conditions are included because HEIs operate within evolving external ecosystems of platforms, vendor markets, interoperability standards, AI/analytics innovation, and cybersecurity threats. Digital transformation research emphasizes that these external technological trajectories and constraints shape what institutions can implement and how risks must be governed [17].

Using PEST in this study is supported by established environmental scanning scholarship and aligns with higher education research emphasizing that macro-level policy, economy, society, and technology dynamics materially condition the digital transformation landscape for Chinese HEIs.

4. Research Method

4.1. Population and Sample

The target population comprised college students and lecturers at higher education institutions in Beijing, China. As of 2025, Beijing was estimated to have 1,109,000 students (87.4%) and 160,300 lecturers (12.6%), yielding a combined population of 1,269,300 individuals. The minimum required sample size was determined using the Krejcie and Morgan [19] sample size table, which indicated 384 respondents for a population of this magnitude. To enhance representativeness across the two population strata, stratified random sampling was employed, with proportional allocation based on population shares. Accordingly, the final sample consisted of 336 students (87.4%) and 48 lecturers (12.6%), for a total of 384 respondents.

4.2. Instrumentation

The study employed a structured questionnaire using a five-point Likert scale with a dual-response format to capture respondents' perceptions of both the current status and the desired status of the six commitments of digital transformation identified in the literature review. The instrument comprised two main sections. The first section examined the internal environment of digital transformation in higher education from the four elements of educational administration, including data management, human resources management, financial management, and academic affairs management. The second section assessed the external environment using the PEST framework, operationalized through four aspects: politics, economy, society, and technology.

4.3. Data Analysis

Descriptive statistics (means and standard deviations) were first computed for all items. The means were interpreted using three need levels: Low range (1.00–2.33), Moderate range (2.34–3.67), and High range (3.68–5.00) to determine each item's need level.

In addition, the Modified Priority Needs Index (PNI modified) was used to identify gaps between the current and desired status. The PNI modified was calculated using the following formula:

$$\text{PNI modified} = \frac{I - D}{D}$$

where:

- I (Importance) = mean score representing the desired level
- D (Degree of Success) = mean score representing the current level of performance

Larger PNI modified values indicate greater gaps between desired and current conditions, reflecting higher priority needs (weaknesses or threats). Conversely, smaller PNI modified values indicate smaller gaps and suggest comparatively stronger performance (strengths or opportunities) [20].

Furthermore, an analysis of the internal and external environment factors was conducted using data derived from the questionnaire and survey forms, with indicators ranked according to priority needs based on the PNI modified. According to Hang-Chuon et al. [21], PNI modified values can classify indicators into priority groups. The cut-off point was computed by subtracting the lowest PNI modified score from the highest PNI modified score and dividing the resulting range by two. The midpoint value served as the threshold for distinguishing high versus low PNI modified results. Indicators with high PNI modified values were interpreted as reflecting areas of greater need and were therefore classified as institutional weaknesses or threats requiring improvement and avoidance. Conversely, indicators with low PNI modified values were interpreted as areas of comparatively lower need and were classified as institutional strengths or opportunities requiring utilization.

5. Results

5.1. Results of Internal Environment

Within the internal environment of Chinese HEIs, the four educational administration elements, data management, human resources management, financial management, and academic affairs management, were examined to identify which aspects of educational administration require further improvement to better fulfill the six commitments of digital transformation in higher education. The descriptive results are shown in Table 1. The findings demonstrate that the overall mean score of the four elements is perceived as only moderately developed in the current status, while the desired status is consistently high.

Specifically, the current-status totals are Data Management (Total M = 3.21, SD = 0.83), Human Resources Management (Total M = 3.26, SD = 0.81), Academic Affairs Management (Total M = 3.30, SD = 0.84), and Financial Management (Total M = 3.34, SD = 0.84). These totals indicate that, within the internal environment, Financial Management is the relatively strongest area at present (highest current mean), whereas Data Management appears to be the relatively weakest (lowest current mean), although the gaps among elements are small.

For the desired state, respondents expect all four internal elements to reach a similarly high level of support, with the following desired-state totals: Data Management (Total M = 4.76, SD = 0.72), Human Resources Management (Total M = 4.77, SD = 0.73), Academic Affairs Management (Total M = 4.78, SD = 0.74), and Financial Management (Total M = 4.84, SD = 0.72). The pattern of "moderate current vs. high desired" across all four elements establishes the empirical basis for the next step by applying PNI modified to quantify the improvement need for each element and to classify them comparatively as strengths (smaller need index) versus weaknesses (larger need index) within the internal environment in terms of educational administration.

Table 1.
Results of Descriptive Statistics of Internal Environments.

Educational Administration	Commitment Items	Current States			Desirable states		
		Mean	SD	Level	Mean	SD	Level
Data Management	Digital learning and shared resources	3.25	0.83	Moderate	4.82	0.71	High
	Equitable education	3.24	0.83	Moderate	4.76	0.71	High
	Effective communication and collaborations	3.19	0.84	Moderate	4.73	0.72	High
	Community participants	3.21	0.82	Moderate	4.79	0.72	High
	Evidenced policy making	3.17	0.84	Moderate	4.76	0.72	High
	Data-driven instruction and assessment	3.23	0.82	Moderate	4.72	0.71	High
	Total of data management	3.21	0.83	Moderate	4.76	0.72	High
Human Resources Management	Digital learning and shared resources	3.31	0.80	Moderate	4.80	0.70	High
	Equitable education	3.23	0.82	Moderate	4.73	0.72	High
	Effective communication and collaborations	3.24	0.81	Moderate	4.77	0.71	High
	Community participants	3.25	0.79	Moderate	4.77	0.71	High
	Evidenced policy making	3.25	0.81	Moderate	4.71	0.76	High
	Data-driven instruction and assessment	3.28	0.82	Moderate	4.83	0.77	High
	Total of Human Resources Management	3.26	0.81	Moderate	4.77	0.73	High
Financial management	Digital learning and shared resources	3.34	0.84	Moderate	4.86	0.72	High
	Equitable education	3.44	0.83	Moderate	4.82	0.71	High
	Effective communication and collaborations	3.30	0.82	Moderate	4.83	0.73	High
	Community participants	3.32	0.86	Moderate	4.82	0.73	High
	Evidenced policy making	3.34	0.84	Moderate	4.82	0.73	High
	Data-driven instruction and assessment	3.35	0.85	Moderate	4.88	0.70	High
	Total of Financial Management	3.34	0.84	Moderate	4.84	0.72	High
Academic Affairs Management	Digital learning and shared resources	3.34	0.83	Moderate	4.78	0.73	High
	Equitable education	3.21	0.86	Moderate	4.78	0.75	High
	Effective communication and collaborations	3.24	0.86	Moderate	4.78	0.75	High
	Community participants	3.31	0.84	Moderate	4.79	0.73	High
	Evidenced policy making	3.35	0.83	Moderate	4.77	0.75	High
	Data-driven instruction and assessment	3.37	0.83	Moderate	4.79	0.74	High
	Total of academic affairs management	3.30	0.84	Moderate	4.78	0.74	High

Based on the descriptive statistics for the internal environment, the overall mean scores for current and desired status were used to compute PNI modified values for each element of educational administration. These values are presented in Table 2.

From the results of PNI modification of the internal environment, the highest PNI modified value is 0.483, and the lowest PNI modified value is 0.448. Therefore, the cut-off point was calculated as follows:

$$\text{Cut-off point} = \frac{0.483 - 0.448}{2} = 0.0175$$

This midpoint value was used to organize PNI modified values into two groups:

- High PNI modified (Weakness): 0.4830 to 0.4655
- Low PNI modified (Strength): 0.4655 to 0.4480

Therefore, among the four elements of educational administration, data management was identified as a weakness, while human resources management, financial management, and academic affairs management were identified as strengths in the internal environment of digital transformation in higher education institutions.

Table 2.
Result PNI Modified of Internal Environment.

Internal Environment	Mean of Current status (D)	Mean of Desirable status (I)	PNI Modified	Strengths/Weaknesses
Data Management	3.21	4.76	0.483	Weakness
Human Resources Management	3.26	4.77	0.463	Strength
Financial management	3.34	4.84	0.449	Strength
Academic Affairs Management	3.30	4.78	0.448	Strength

5.2. Results of External Environment

In an external environment analysis, the PEST dimensions (Politics, Economy, Society, and Technology) are interpreted as potential opportunities and threats that can influence Chinese HEIs' ability to fulfill the six commitments of digital transformation in higher education. As shown in Table 3, respondents rated the current state of these external conditions as moderate overall (item means approximately $M = 3.04\text{--}3.37$, $SD \approx 0.78\text{--}0.88$), while the desired state was consistently high (approximately $M = 4.71\text{--}4.88$, $SD \approx 0.69\text{--}0.82$). This indicates that stakeholders perceive the current external enabling conditions as only partially supportive but expect a substantially stronger environment to effectively sustain digital transformation commitments.

At the dimension level, the current-status totals are Politics (Total $M = 3.26$, $SD = 0.84$), Economy (Total $M = 3.15$, $SD = 0.85$), Society (Total $M = 3.26$, $SD = 0.84$), and Technology (Total $M = 3.31$, $SD = 0.81$). These results suggest that Technology represents the relatively most favorable current external condition (a comparative opportunity), whereas the economy appears comparatively less supportive at present (a potential threat), though the differences among dimensions are small. For the desired state, all totals are rated high: Politics (Total $M = 4.85$, $SD = 0.74$), Economy (Total $M = 4.81$, $SD = 0.75$), Society (Total $M = 4.77$, $SD = 0.80$), and Technology (Total $M = 4.81$, $SD = 0.73$). The consistent "moderate current vs. high desired" pattern provides the basis for applying PNI modified to determine which PEST dimension constitutes the largest external threat (largest need gap) versus the strongest external opportunity (smallest need gap) for advancing the six commitments.

Table 3.
Results of Descriptive Statistic of External Environments.

PEST Framework	Commitment Items	Current States			Desirable states		
		Mean	SD	Level	Mean	Mean	SD
Politics	Digital learning and shared resources	3.12	0.88	Moderate	4.87	0.70	High
	Equitable education	3.28	0.82	Moderate	4.86	0.78	High
	Effective communication and collaboration	3.35	0.84	Moderate	4.79	0.80	High
	Community participant	3.37	0.79	Moderate	4.84	0.75	High
	Evidence-based policymaking	3.25	0.83	Moderate	4.86	0.70	High
	Data-driven instruction and assessment	3.17	0.85	Moderate	4.88	0.69	High
	Total of Politics	3.26	0.84	Moderate	4.85	0.74	High
Economy	Digital learning and shared resources	3.19	0.84	Moderate	4.85	0.73	High
	Equitable education	3.15	0.86	Moderate	4.83	0.71	High
	Effective communication and collaboration	3.17	0.85	Moderate	4.77	0.76	High
	Community participant	3.04	0.88	Moderate	4.78	0.79	High
	Evidence-based policymaking	3.22	0.84	Moderate	4.81	0.77	High
	Data-driven instruction and assessment	3.11	0.82	Moderate	4.84	0.71	High
	Total of Economy	3.15	0.85	Moderate	4.81	0.75	High
Society	Digital learning and shared resources	3.33	0.79	Moderate	4.82	0.79	High
	Equitable education	3.18	0.87	Moderate	4.75	0.81	High
	Effective communication and collaboration	3.15	0.86	Moderate	4.71	0.79	High
	Community participant	3.27	0.86	Moderate	4.81	0.77	High
	Evidence-based policymaking	3.32	0.81	Moderate	4.78	0.82	High

Technology	Data-driven instruction and assessment	3.28	0.84	Moderate	4.76	0.79	High
	Total of Society	3.26	0.84	Moderate	4.77	0.80	High
	Digital learning and shared resources	3.32	0.78	Moderate	4.83	0.74	High
	Equitable education	3.23	0.82	Moderate	4.87	0.70	High
	Effective communication and collaboration	3.28	0.84	Moderate	4.76	0.75	High
	Community participant	3.33	0.80	Moderate	4.74	0.72	High
	Evidence-based policymaking	3.35	0.79	Moderate	4.81	0.73	High
	Data-driven instruction and assessment	3.32	0.80	Moderate	4.83	0.73	High
	Total of Technology	3.31	0.81	Moderate	4.81	0.73	High

Given the overall mean score of the four aspects of the PEST framework, the PNI modified values of the external environment were calculated as shown in Table 4. The highest PNI modified value is 0.527, and the lowest PNI modified value is 0.453. Therefore, the cut-off point was calculated as follows:

$$\text{Cut-off point} = \frac{0.527 - 0.453}{2} = 0.037$$

This midpoint value was used to organize PNI modified values into two groups:

- High PNI modified (Threats): 0.527 to 0.490
- Low PNI modified (Opportunities): 0.490 to 0.453

Therefore, among the four aspects of the external environment, the economy was identified as a threat, while politics, society, and technology were considered opportunities.

Table 4.
PNI Modified Results of External Environment.

External environment	Mean of Current status (D)	Mean of Desirable status (I)	PNI Modified	Rank	Opportunities/Threats
Politics	3.26	4.85	0.488	2	Opportunity
Economy	3.15	4.81	0.527	1	Threat
Society	3.26	4.77	0.463	3	Opportunity
Technology	3.31	4.81	0.453	4	Opportunity

6. Discussion

6.1. Internal Weaknesses: Data Management

The finding that data management exhibits the highest PNI modified value (0.483) among internal elements indicates that stakeholders perceive the largest gap between current and desired conditions in this domain. In this view, a larger gap between current and desired data management conditions signals a higher priority for intervention. Without reliable and integrated data assets, digital initiatives remain localized and rarely scale to institution-wide transformation.

This finding aligns with prior research emphasizing that data infrastructure and governance constitute foundational requirements for digital transformation in higher education [3]. The centrality of data management reflects contemporary expectations that institutions move beyond siloed administrative systems toward integrated platforms capable of supporting learning analytics, evidence-based decision-making, and quality assurance processes. For Chinese HEIs, this weakness is particularly salient given national policy emphasis on "smart campuses" and data-driven governance alongside documented challenges in data interoperability and institutional capacity for data stewardship across a diverse and rapidly expanding system.

6.2. Internal Strengths in HR, Finance, and Academic Affairs

The relatively lower PNI modified values for human resources management (0.463), financial management (0.449), and academic affairs management (0.448) indicate that these administrative domains are perceived as strengths within the internal environment. This pattern suggests that

respondents view current institutional capacity in staffing, budgeting, and academic governance as more closely aligned with desired conditions than data infrastructure.

This finding aligns with research emphasizing that organizational readiness for digital transformation depends not only on technology but also on people, processes, and resource allocation [8]. The identification of HR, finance, and academic management as strengths provides a strategic foundation: institutions can leverage existing administrative capacity to support targeted investment in data management improvements, coordinate cross-functional digital transformation teams, and integrate data initiatives into established academic quality assurance mechanisms.

6.3. External Opportunities: Political, Social, and Technological Enablers

The classification of politics (PNI modified = 0.488), society (0.463), and technology (0.453) as external opportunities indicates that respondents perceive these dimensions as relatively favorable conditions for advancing digital transformation. The political dimension reflects supportive national policy frameworks, including the 14th Five-Year Plan priorities for educational modernization and digital infrastructure development [16]. The social dimension captures shifting stakeholder expectations for flexible, accessible, and personalized digital services, accelerated by pandemic-era experiences with online learning [18]. The technological dimension reflects the availability of mature platforms, cloud services, and AI/analytics tools in the broader ecosystem, alongside growing vendor capacity to support institutional implementations [17].

These findings align with environmental scanning research emphasizing that successful digital transformation strategies must identify and capitalize on favorable macro-level conditions. For Chinese HEIs, the convergence of supportive policy, societal readiness, and technological maturity creates a strategic opportunity window for advancing digital transformation commitments, provided that internal capacity challenges, particularly data management, can be addressed.

6.4. External Threat: Economic Constraints

The identification of the economy as the primary external threat (PNI modified = 0.527) reflects stakeholder perceptions that current economic conditions are least supportive of desired digital transformation outcomes. This finding is consistent with research linking financial constraints to uneven digital transformation implementation across stratified higher education systems [21]. Economic threats may include fiscal pressures on institutional budgets, competing demands for limited resources, affordability concerns for students and families, and macroeconomic uncertainties affecting sustained investment in digital infrastructure and capability building.

For Chinese HEIs, economic constraints are particularly relevant given system differentiation between well-resourced flagship institutions and less-resourced regional and vocational colleges, alongside policy expectations for broad-based digital transformation across diverse institutional types. Addressing this threat requires coordinated policy intervention, including targeted funding mechanisms, public-private partnerships, and economies of scale through platform sharing and consortium arrangements.

In summary, the SWOT-PEST analysis using PNI modified provides empirical grounding for strategic priority-setting. The identification of data management as the primary internal weakness, combined with the recognition of economic constraints as the main external threat, suggests that feasible digital transformation strategies must balance ambitious digital infrastructure development with realistic assessment of resource constraints and phased implementation pathways. Conversely, the identification of HR, finance, and academic management as internal strengths, alongside political, social, and technological opportunities, indicates that institutions possess foundational administrative capacity and operate within a broadly enabling environment that can be mobilized to advance data-driven transformation.

7. Conclusion and Implications

7.1. Conclusion

This study provides a comprehensive assessment of the digital transformation landscape of Chinese Higher Education Institutions through a SWOT analysis combined with a PEST framework. The findings identify data management as a pronounced internal weakness, while human resources, finance, and academic affairs management are recognized as relative strengths. Externally, economic factors emerge as significant threats, yet political, societal, and technological aspects present numerous opportunities for advancement. To bridge the gap between the current and desired states of digital transformation among college students and lecturers, future research should extend these findings into a TOWS matrix. This approach can generate actionable educational administration strategies, such as SO, WO, ST, and WT strategies for Chinese HEIs to formulate targeted and strategic responses and enable harnessing their internal strengths and external opportunities while mitigating weaknesses and threats.

7.2. Theoretical Implications

This research contributes to the literature by demonstrating the utility of combining SWOT–PEST analysis with quantitative priority needs assessment (PNI modified) to identify specific capacity gaps and strategic priorities. The findings support prior studies emphasizing the centrality of data infrastructure in digital transformation while extending this work by quantifying relative priority levels across multiple administrative domains.

7.3. Practical Implications

- For HEI leaders: Prioritize investment in data management infrastructure, including data governance frameworks, interoperability standards, and staff training in data stewardship and analytics.
- For policymakers: Strengthen economic support mechanisms (funding, incentives) to mitigate financial barriers, while leveraging political, social, and technological opportunities through policy enablement and public–private partnerships.
- For institutional planners: Use the identified strengths (HR, finance, academic management) as leverage points for implementing data-driven initiatives and building cross-functional digital transformation teams.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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